**Question 1: What are the different types of operators in JavaScript? Explain with examples. Arithmetic operators Assignment operators Comparison operator’s Logical operators.**

Types of Operators in JavaScript

JavaScript provides different types of operators to perform operations on variables and values. Here are the major types of operators in JavaScript with examples:

**1. Arithmetic Operators**

These operators perform mathematical calculations like addition, subtraction, multiplication, etc.

| Operator | Description | Example |
| --- | --- | --- |
| + | Addition | let sum = 10 + 5; // 15 |
| - | Subtraction | let diff = 10 - 5; // 5 |
| \* | Multiplication | let product = 10 \* 5; // 50 |
| / | Division | let quotient = 10 / 5; // 2 |
| % | Modulus (Remainder) | let remainder = 10 % 3; // 1 |
| \*\* | Exponentiation (Power) | let power = 2 \*\* 3; // 8 |
| ++ | Increment (Increase by 1) | let x = 5; x++; // x = 6 |
| -- | Decrement (Decrease by 1) | let y = 5; y--; // y = 4 |

Example:

let a = 10;

let b = 5;

console.log(a + b); // Output: 15

console.log(a - b); // Output: 5

console.log(a \* b); // Output: 50

console.log(a / b); // Output: 2

console.log(a % b); // Output: 0

console.log(a \*\* b); // Output: 100000

**2. Assignment Operators**

These operators assign values to variables.

| **Operator** | **Description** | **Example** |
| --- | --- | --- |
| = | Assigns a value | let x = 10; |
| += | Adds and assigns | x += 5; // x = x + 5 |
| -= | Subtracts and assigns | x -= 5; // x = x - 5 |
| \*= | Multiplies and assigns | x \*= 5; // x = x \* 5 |
| /= | Divides and assigns | x /= 5; // x = x / 5 |
| %= | Modulus and assigns | x %= 3; // x = x % 3 |
| \*\*= | Exponentiation and assigns | x \*\*= 2; // x = x \*\* 2 |

Example:

let x = 10;

x += 5; // x = 15

x -= 2; // x = 13

x \*= 2; // x = 26

x /= 2; // x = 13

x %= 3; // x = 1

x \*\*= 2; // x = 1

console.log(x);

3. Comparison Operators

These operators compare two values and return a Boolean (true or false).

| Operator | Description | Example |
| --- | --- | --- |

|  |  |  |
| --- | --- | --- |
| == | Equal to (checks only value) | 10 == "10"; // true |

|  |  |  |
| --- | --- | --- |
| === | Strict equal (checks value and type) | 10 === "10"; // false |

|  |  |  |
| --- | --- | --- |
| != | Not equal | 10 != 5; // true |

|  |  |  |
| --- | --- | --- |
| !== | Strict not equal | 10 !== "10"; // true |

|  |  |  |
| --- | --- | --- |
| > | Greater than | 10 > 5; // true |

|  |  |  |
| --- | --- | --- |
| < | Less than | 10 < 5; // false |

|  |  |  |
| --- | --- | --- |
| >= | Greater than or equal | 10 >= 10; // true |

|  |  |  |
| --- | --- | --- |
| <= | Less than or equal | 10 <= 5; // false |

**Example:**

let a = 10, b = "10";

console.log(a == b); // true (only values are compared)

console.log(a === b); // false (value and type are compared)

console.log(a != b); // false

console.log(a !== b); // true

console.log(a > 5); // true

console.log(a <= 10); // true

**4. Logical Operators**

These operators are used to combine multiple conditions and return a boolean value.

| **Operator** | **Description** | **Example** |
| --- | --- | --- |
| && | Logical AND (both conditions must be true) | (10 > 5 && 5 < 8) // true |
| ` |  | ` |
| ! | Logical NOT (negates the condition) | !(10 > 5) // false |

**Example:**

let age = 20;

let isAdult = (age >= 18 && age < 65);

console.log(isAdult); // true

let isWeekend = false;

let canGoOut = (isAdult || isWeekend);

console.log(canGoOut); // true

console.log(!isAdult); // false

**Question 2: What is the difference between == and === in JavaScript?**

**Difference Between == and === in JavaScript**

In JavaScript, both == and === are comparison operators, but they work differently.

| **Operator** | **Name** | **Comparison Type** | **Example** | **Output** |
| --- | --- | --- | --- | --- |
| == | Equality Operator | Compares values only (allows type conversion) | 5 == "5" | true |
| === | Strict Equality Operator | Compares values and types (no type conversion) | 5 === "5" | false |

**1. == (Equality Operator)**

* **Performs type conversion** (also known as **type coercion**).
* If the types are different, JavaScript tries to convert one type to match the other before comparing.

**Example:**

console.log(5 == "5"); // true (string "5" is converted to number 5)

console.log(0 == false); // true (false is converted to 0)

console.log(null == undefined); // true

console.log(10 == "10.0"); // true (string converted to number)

**2. === (Strict Equality Operator):**

* Does not perform type conversion.
* Compares both value and data type**.**
* Returns true only if both are the same type **and** have the same value.

**Example:**

console.log(5 === "5"); // false (different types: number vs. string)

console.log(0 === false); // false (boolean vs. number)

console.log(null === undefined); // false (different types)

console.log(10 === 10.0); // true (same type and value)